

Final

Meeting Minutes Transmittal/Approval  
Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
450 Hills Street, Richland, Washington  
September 23, 1992

FROM/APPROVAL: Eric D Goller Date 10-21-92  
Eric D. Goller, 100 Area Unit Manager, RL (A5-19)

APPROVAL: Jeff Phillips Fee Date 10-21-92  
Darrl Fee, 100 Aggregate Area Unit Manager, WA Department of Ecology

APPROVAL: Laurence E Stadler Date 10-21-92  
Dennis Faulk, 100 Aggregate Area Unit Manager, EPA (B5-01)

Meeting Minutes are attached. Minutes are comprised of the following:

- Attachment #1 - Meeting Summary
- Attachment #2 - Agenda
- Attachment #3 - Attendance
- Attachment #4 - Action Item Status List
- Attachment #5 - 100 Area Wide Activities Schedule
- Attachment #6 - Status of 100-Area Wide Activities
- Attachment #7 - Estimating Aquifer Hydraulic Properties Using the Ferris Method
- Attachment #8 - Work Plan Status
- Attachment #9 - M-30-03 Status
- Attachment #10 - 100-DR-1, 100-HR-1, 100-NR-1 OUs
- Attachment #11 - 100-HR-3, 100-NR-2 OUs
- Attachment #12 - 100-BC-1, 100-KR-1, 100-FR-1 OUs
- Attachment #13 - 100-BC-5, 100-KR-4, 100-FR-3 OUs
- Attachment #14 - 100 Area Feasibility Study Soil Remediation Alternatives and Treatability Studies
- Attachment #15 - Sample Status

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Prepared by: Suzanne Clarke Date: 10/21/92  
Suzanne Clarke, Kay Kimmel, GSSC (A4-35)

Concurrence by: RPKL Date: 10/21/92  
Bob Henckel, WHC Coordinator (H4-55)



Attachment #1  
Meeting and Summary of Commitments and Agreements

Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
September 23, 1992

- 9 2 1 2 7 3 7 1 0 2 3
1. SIGNING OF THE AUGUST 100 AREA UNIT MANAGER'S MEETING MINUTES - Minutes were reviewed and approved with no changes.
  2. ACTION ITEM UPDATE: (See Attachment 4 for complete status, items listed below indicate the update to Action Items made during the meeting):
    - 1AAMS.5 Open, suggest regulators contact Heather Trumble (RL).
    - 1AAMS.7 Open, no additional information.
    - 1AAMS.9 Open, on General Topics agenda for October.
    - 1AAMS.12 Closed, based on a letter to Ecology concerning 100-NR-2 well monitoring network.
    - 1AAMS.14 Closed 09/23/92 at General Topics meeting.
    - 1AAMS.15 Open, no additional information.
    - 1AAMS.16 Open, no additional information.
  3. NEW ACTION ITEMS (INITIATED SEPTEMBER 23, 1992):

No new action items.
  4. 100 AREA ACTIVITIES: See Attachment #5 for the schedule.

100 Area General Discussions

- Status of 100 Area Wide Activities - Steve Weiss (WHC) presented these activities (see attachment #6).
- M-30-04 - Bob Peterson (WHC) presented an overview of the milestone, and an outline of "Estimating Aquifer Properties Using the Ferris Method Hanford Site" (see attachment #7).
- Sample Status - Karl Pool (WHC) presented the sample status (see attachment #15, not yet available).
- Work Plan Status - Bob Henckel (WHC) presented the work plan status (see attachment #8).
- M-30-03 - Status presented by B. Henckel (see attachment #9).

5. FIELD ACTIVITIES:

100-DR-1, 100-HR-1, 100-NR-1 Operable Units - Jeff Ayres (WHC) presented the status of 100-HR-1 and 100-DR-1, B. Henckel presented 100-NR-1 (Attachment #10).

100-HR-3, 100-NR-2 Operable Units - Steve Vukelich (WHC) presented the status (Attachment #11).

100-BC-1, 100-KR-1, 100-FR-1 Operable Units - presented by Naik Naiknimbalkar (WHC) (Attachment #12).

100-BC-5, 100-KR-4, 100-FR-3 Operable Units - presented by Jim Roberts (WHC) (see attachment #13).

6. INFORMATION ITEMS

- 100 Area Work Plan Format - Meeting tentatively scheduled for 1:00 pm Oct. 5, 1992 at the EPA Conference Room, to discuss 100 Area Work Plan format, specifically 100-BC-2 Work Plan format. Suggestion was made to reference generic sections from 100-BC-1.
- Soil Remediation Alternatives and Treatability Studies - Presented by Jerry Chiaramonte (see attachment #14).
- Early Remediation - A discussion on early remediation was held. The Pluto Cribs continue to be a primary focus for early remediation.

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Attachment #2

100 Area Unit Managers Meeting Agenda

100 Area General Discussions

- 100 Area Common Studies - Steve Weiss
- M-30-04 - Bob Peterson
- Sample Status - Karl Pool
- Work Plan Status - Bob Henckel
- M-30-03 - Bob Henckel

100-DR-1, 100-HR-1, 100-NR-1 Operable Units - Jeff Ayres

- Activity Status and General Discussions

100-HR-3, <sup>100-NR-2</sup>~~100-KR-1~~, ~~100-FR-1~~ Operable Units - Steve Vukelich

- Activity Status and General Discussions

100-BC-1, 100-KR-1, 100-FR-1 Operable Units - N. Naiknimbalkar

- Activity Status and General Discussions

100-BC-5, 100-KR-4, 100-FR-3 Operable Units - Jim Roberts

- Activity Status and General Discussions

Other

- Action Item Status - All

Past Practices

- Soil Remediation Alternatives and TS - Jerry Chiaramonte
- Strategy Presentation - TBD

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100 Aggregate Area Unit Manager's Meeting  
Official Attendance Record  
September 23, 1992

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PRINTED NAME	SIGNATURE	ORGANIZATION	O.U. ROLE	TELEPHONE
ROBERT HENCKEL		WHC	100 AREA	509 376-2091
DIB GOSWAMI		Ecology	100 Area	509-546-4301
JEFF PHILLIPS		Ecology	UNIT Mgr.	509-542-2968
Chuck Clae		Ecology	Unit Mgr.	(206) 438-7556
JACK DONNELLY		WDOE	100 OUM	509-546-4313
ERIC GOLLER		RL	100 Area UM	509 376-7376
Pamela Innis		EPA	UNIT MANAGER	509/376-4919
Karl N. Pool		WHC	OSM 100 Areas	509/373-3137
Jeffrey M. Ayres		WHC	100-FR-1 100-HR-1 / HR2	509-376-3918
N.M. Naiknimbalkar		WHC	100 KR-1 100 DR-1	509-376-8239
R. E. PETERSON		WHC	100 Check Groundwater	509/376-5858
Brian Drost		USGS	EPA Support	(206) 593-6510
Steve Cross		Ecology	CERCLA Unit	206 459 6675
Janet Franco		ODOE (Oregon)	observer	(503) 378-3187
Larry Gadbois		EPA	Unit Manager	509 376-9884
Mike Stankovich		WHC	100 Area	509 376 2493
Dennis Faulk		EPA	Unit Manager	6-8631
Steve Weiss		WHC	100 support unit	6-1633
Bill Kane		Parametrix	Ecology Support	206-822-8880
Jon Sprockho		Brown & Caldwell	Ecology Support	(503) 244-7005
J. K. PATTERSON		WHC	ER Program	509 376-0588
S. E. Clarke		SWEC	ASSC to RL	(509) 372-0630
KAY KIMMEL		SWEC	ASSC	509 372-0610
Audree De Angeles		PRC	EPA Support	206-624-2692
Neil Morton		PRC	EPA Support	206-624-2692



Attachment #4  
Action Item Status List

Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
September 23, 1992

ITEM NO.	ACTION	STATUS
1HR3.32	Regarding the removal of the vent pipes, WHC will: 1) Determine the need for an ACE permit; 2) obtain a letter from ACE that gives approval to begin work before the need for the permit is determined; and, 3) draft letters on the matter to the Natural Resources Trustees. Action: A. Krug (1/15/90)	Closed (8/26/92). Pending overall resolution (7/18/91). NEPA wetlands approval pending. USACE approval: resolution pending. 6/24/92 Floodplain statement of findings published 7/23/92. (7/29/92) Information Bulletin for categorical exclusion to DOE-RL for approval (8/17/92).
1AAMS.5	Ecology and EPA are to be provided with sampling data on mulberries from N-Springs as well as data from the vegetation eradication program. The specific herbicides that were used are to be included. Action: T. Poston and J. Goodenough. (1/23/92)	Open. Confirm that letter went out 6/24/92. Submitted to DOE on 5/18/92. (8/26/92). Contact Heather Trumble (RL) for information (9/23/92).
1AAMS.7	Provide information to the regulators on how to retrieve rad counting data from the 222-S Lab. Action to Jeff Lerch (2/27/92). Action: Karl Pool (6/24/92)	Open. How does WHC get their data for shipping? Working with the sampling organization that receives the lab analyses to obtain the data and will work on getting the information to the regulators (8/5/92). No additional information (8/26/92), (9/23/92).
1AAMS.9	DOE shall send a letter to Ecology, suggested from S. H. Wisness to D. Jansen with a cc. to EPA, explaining what is included in the ER Program for the N Reactor Area and how the multiple programs will be handled organizationally. Action to J. D. Goodenough (2/27/92). Action: E. D. Goller (5/27/92).	Open. Related to the N Areas Issues Papers. No answer 7/29/92. No additional information (8/26/92). On General Topics Agenda for October (9/23/92).

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ITEM NO.	ACTION	STATUS
1AAMS.12	Ecology requested that sampling on oil and grease well network be restarted in down-gradient wells N-3, N-8, and N-16 through N-26 (5/22/92 letter to Eric Goller from Steve Cross). Action to E.D. Goller (RL) 5/27/92	Closed (9/23/92). No action 7/29/92. Draft NR-2 GW monitoring network in DOE review. Expect to resolve by Sept. UMM (8/26/92). Based on a letter to Ecology concerning 100-NR-2 well monitoring network.
1AAMS.14	Schedule a presentation on the Hanford Site Past Practice Strategy targeted for the middle-to-latter part of August. Action: Eric Goller (RL) (7/29/92).	Closed (9/23/92) at General Topics Meeting.
1AAMS.15	Provide response to April 2 EPA letter concerning river seeps. Action: Eric Goller (RL) 7/29/92.	Open (7/29/92). In DOE for transmittal (8/26/92). No additional information (9/23/92).
1AAMS.16	DOE should transmit Revision 1 of M-30-01.	Open (7/29/92). In DOE for transmittal (8/26/92). No additional information (9/23/92).

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## Status of 100-Area Wide Activities

River Impact Studies

2.2, Regulator Review of Columbia River Impact Evaluation Plan: Regulator review and comment negotiations in progress. Next meeting scheduled for Sept 24.

3.4, Secondary Report Prep., Milestone M-30-04. In progress, to be completed by September 30

4.0, Long-term Aquifer/River Interactions planning, Milestone M-30-05, in progress, FY 92 work will be completed

Cultural Resources Investigations

2.0, Inter-reactor field surveys, completed.

3.0, Secondary Report Preparation for FY 1992 activities, in preparation, to be completed in FY 1993

Ecological Investigations

1.0, Data Compilation/Synthesis, final draft to editor. Expect publication in October

2.0, Aquatic Sampling, data finally back from labs, 1st draft of report completed.

3.0, Terrestrial & Riparian sampling, 95% completed, only some burrow soil from N area to collect (not a part of M-30-03).

4.2, Threatened and Endangered Species Assessments (Bald Eagle Plan, Bio. Assessment for T&E wildlife), editors making final changes, need final review by DOE-RL-TSD, then sent to US Fish and Wildlife Service and Washington Department of Wildlife.

5.0, FY 1991 and 1992 terrestrial ecological studies report; in preparation, for publication in FY 1993.

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UNIT MANAGER MEETING HANDOUT (9/23/92)

ESTIMATING AQUIFER HYDRAULIC PROPERTIES  
USING THE FERRIS METHOD, HANFORD SITE, WASHINGTON

W. J. McMahon and R. E. Peterson  
Geosciences Group, Westinghouse Hanford Company

CONTENTS

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- 1.0 INTRODUCTION . . . . .
- 1.1 PURPOSE . . . . .
- 1.2 RIVER/GROUNDWATER INTERACTION: A SYNOPSIS . . . . .
- 1.3 RELATIONSHIP BETWEEN AQUIFER PROPERTIES AND WATER LEVELS . . . . .
- 2.0 PREVIOUS WORK AT HANFORD SITE . . . . .
- 2.1 BIERSCHENK (1959) . . . . .
- 2.2 100-N AREA STUDIES . . . . .
- 2.3 300 AREA STUDIES . . . . .
- 2.4 OTHER RELATED INVESTIGATIONS . . . . .
- 3.0 APPLICATION OF FERRIS METHOD . . . . .
- 3.1 INTRODUCTION . . . . .
- 3.2 FERRIS METHOD . . . . .
- 3.3 WATER LEVEL DATA . . . . .
- 3.4 RESULTS . . . . .
- 3.5 DISCUSSION . . . . .
- 4.0 REFERENCES . . . . .
- APPENDIX A: REVIEW OF METHODS FOR ESTIMATING AQUIFER PROPERTIES . . . . .
- APPENDIX B: 100 AREAS DATA LOGGER INSTALLATIONS . . . . .
- APPENDIX C: DATA USED IN FEASIBILITY STUDY OF FERRIS METHOD . . . . .
- APPENDIX D: BIERSCHENK (1959) ANALYSIS OF CYCLIC FLUCTUATIONS . . . . .
- APPENDIX E: BIBLIOGRAPHY . . . . .

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WORK PLAN STATUS  
September 22, 1992

Operable Unit	Public Review	Transmit to RL	Transmit to Lead Regulatory Agency	Final Approval received from Lead Regulatory Agency
100-BC-1	3/19 - 4/18, 1992	7/7/92	7/14/92	7/22/92
100-BC-5	4/13 - 5/13, 1992	7/20/92	7/31/92	8/4/92
100-KR-1	5/11 - 6/10, 1992	7/21/92	*	8/28/92
100-KR-4	5/11 - 6/10, 1992	9/22/92		
100-FR-1	6/1 - 7/1, 1992	7/28/92	*	9/1/92
100-FR-3	6/1 - 7/1, 1992	9/22/92		
100-HR-1	7/6 - 8/4, 1992	10/8/92	10/15/92	
100-DR-1	7/6 - 8/4, 1992	10/8/92	10/15/92	
100-HR-3	7/6 - 8/4, 1992	10/8/92	10/15/92	
100-NR-1	TBD			
100-NR-2	TBD			

TBD = To Be Determined

M-30-03 STATUS

Tri-Party Agreement milestone M-30-03 is anticipated to be completed by its due date September 30, 1992. The milestone reads:

- o complete all non-intrusive work as identified in draft work plans for the following operable unit work plans by September 1992:

100-HR-1  
 100-HR-3  
 100-DR-1  
 100-BC-1  
 100-BC-5  
 100-KR-1  
 100-KR-4  
 100-NR-1  
 100-NR-2  
 100-FR-1  
 100-FR-3

A breakdown of individual tasks for each operable unit is shown in the attached table. The tasks were agreed upon by all parties at the May 1992 Unit Manager's Meeting and issued June 4, 1992. A revision to a 100-NR-1 task was made in August 1992, details are as follows:

- o The N Area surface radiation survey task was completed to the extent possible until the levels of sky shine became too high to obtain reliable data. A modification was made to the milestone to remove those areas from the scope of the task and approved at the Unit Managers Meeting. An attempt will be made in fiscal year 1993 to continue the survey, utilizing new equipment expected on site in January 1993.

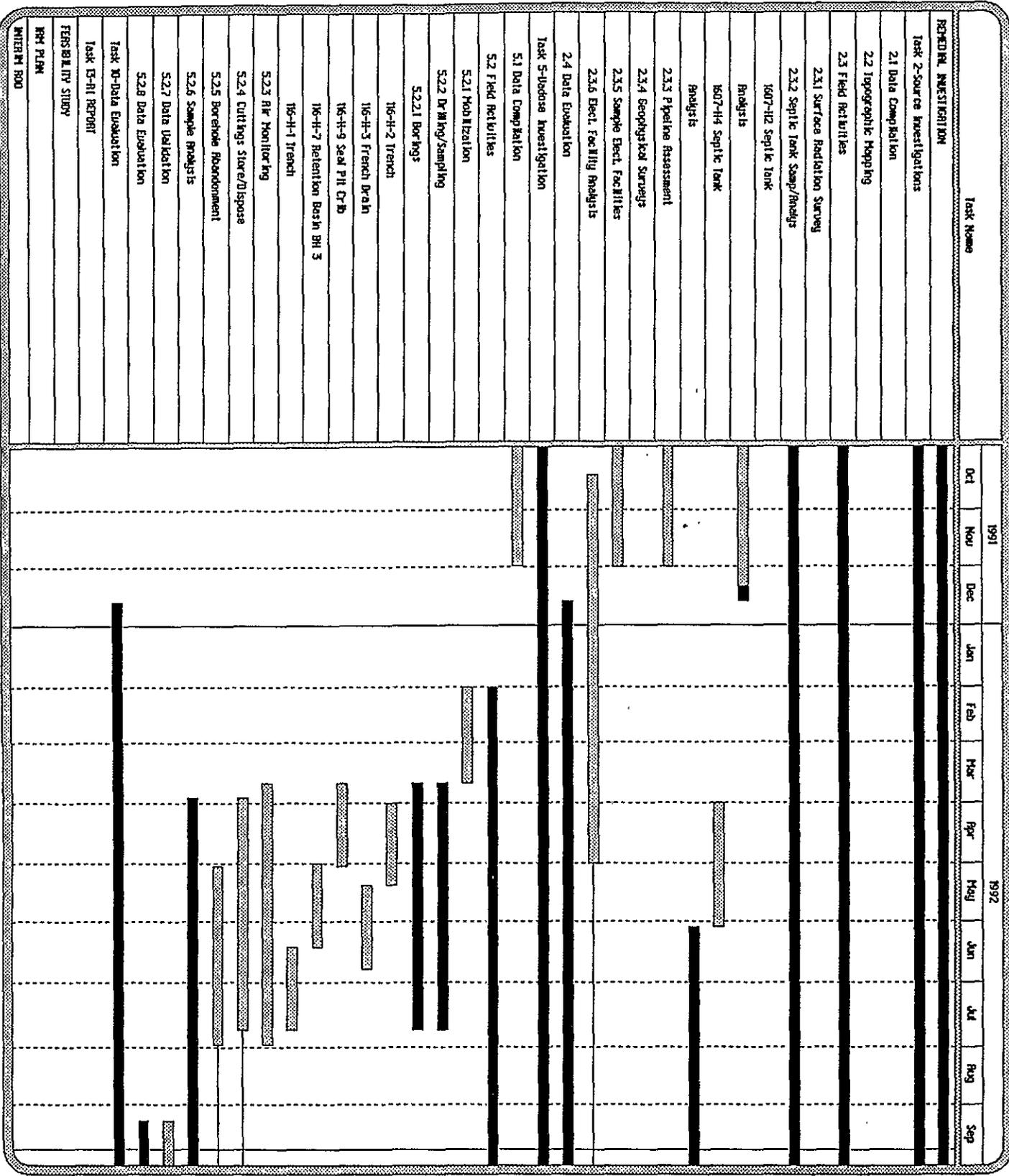
All the individual tasks have been completed except the sampling of the 103-D Green Metal Storage Building. It is scheduled for September 28, 1992. There is a possibility that the semi-VOA analyte sample will slip past the milestone. A problem is arising with obtaining the proper fresh-air equipment for use in taking the semi-VOA analyte sample. If the equipment is not in place by September 28, 1992, 80% of the analytes for that task will be completed and the semi-VOA analyte sample will be rescheduled for fiscal year 1993. All the milestone tasks were planned and managed in good faith to be achieved by the due date.

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**100-DR-1, 100-HR-1, 100-NR-1 OU's**

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 100-HR-1 Operable Unit - Jerrf Ayres



## 100-HR-1 TASKS, SEPTEMBER 1992

### Task 1, Project Management

-On Going

### Task 2, Source Investigation

- Data Compilation, Completed (Dec 91)
- Topographic Mapping, Completed (Aug 91)
- Site Walkover, to be completed Spring-Summer 1992
- Surface Radiation Survey, Completed (Oct 91)
- Geophysical Survey-Completed (June 91)
- Septic Tanks, Completed (Jul 92)
- Pipeline Assessment- Completed (Jan 92)
- Electrical Facilities, Completed Sampling Dec 91

### Task 3, Geological Investigation

-Performed as part of 100-HR-3

### Task 4, Surface Water and Sediment Investigation

-Performed as part of 100-HR-3

### Task 5, Vadose Zone Investigation

- Drilling started on 26 Feb 1992
- Drilling completed on 13 Mar 1992
- 5 Boreholes Completed
  - 116-H-1 (Disposal Trench)
  - 116-H-2 (Disposal Trench)
  - 116-H-3 (French Drain)
  - 116-H-7 (Retention Basin)
  - 116-H-9 (Seal Pit Crib)

### Task 6, Groundwater Investigation

-Performed as part of 100-HR-3

### Task 7, Air Investigation

-Activity being performed as routine health and safety air monitoring in support of investigation activities.

### Task 8, Ecological Investigation

-Performed as part of 100-HR-3

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## 100-HR-1 SAMPLE STATUS

### 1607-H-2 SEPTIC SAMPLES

- 7 Samples: Under Validation at this time.

### 1607-H-4 SEPTIC SAMPLES

- 6 Samples: Currently being analyzed at the labs. Should be validated by Jan 93.

### 100-HR-1 ELECTRICAL FACILITY SAMPLES

- 8 Samples: Validated and submitted to DOE.

### 100-HR-1 VADOSE BOREHOLE SAMPLES

- 23 Samples: All have been analyzed. Almost all are under a Non-Comformance Report which will be cleared up during the week of 14-18 Sep 92.

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100-HR-1 DOW Schedule,		3/20/92		
Title & Document Number of DOW		One Week DOE-RL review starting:	Two week Regulatory review starting:	Sampling Activity starting:
1	100-H & 100-B Area Electrical Facilities Source Sampling, WHC-SD-EN-AP-064, Rev. 1	Completed	Completed	December 9, 1991
2	Description of Work for the 100-HR-1 Source Operable Unit, WHC-SD-EN-AP-066	Completed	Completed	February 26, 1992
3	1607-H4 Septic Tank Sampling, WHC-SD-EN-AP-096	Completed	Completed	August 3, 1992
4				
5				

## 100-HR-1 DOCUMENTS

- o 100-HR-1 GEOPHYSICAL SURVEYS WHC-MR-0263
- o 100-HR-1 RADIOLOGICAL SURVEYS WHC-MR-0275
- o Engineering Report for H Area Process WHC-SD-NR-ER-092  
Effluent Line Examination

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UNIT MANAGER'S MEETING  
100-DR-1 0U  
September 23-24, 1992  
Room 47, 450 Hills

Presenter - N. M. (Naik) Naiknimbalkar

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100-DR-1 Remedial Investigation

TASK NO.	ACTIVITY	STATUS
Task 2	SOURCE INVESTIGATION	
Task 2.1	DATA COMPILATION	COMPLETED DECEMBER 1992
Task 2.2	TOPOGRAPHIC MAPS	COMPLETED AUGUST 1991
Task 2.3.1	SURFACE RADIATION SURVEY	COMPLETED APRIL 1992
	SITES: 100-DR-1 Area with the exception of Controlled Zones.	
Task 2.3.2	GEOPHYSICAL SURVEY	COMPLETED MAY 1991
	SITES: 116-D-2 Pluto Crib Waste Acid Disposal Reservoir 1607-D4 Septic Tank Questionable Septic Tank (Routine surveys were conducted to locate drill hole sites & non-intrusive sites).	
Task 2.3.3	Soil Gas Surveys	Completed.
Task 2.3.4	Non-Intrusive Sampling	Completed. 103 Green Metal Storage Building Sampling will be completed on 9-28-92.

Descriptions of Work (DOW's): See Table 1.

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100-NR-1 Operable Unit Status  
September Unit Managers Meeting

1. Surface Radiation Survey

The N Area surface radiation survey has been completed to the extent possible. Approximately 162 acres could not be surveyed because of high levels of sky shine. An attempt will be made in FY93 to continue the survey, using some new equipment expected to be on site in January, 1993. If this is unsuccessful, the survey will be postponed until the sky shine problem is corrected. A modification to the Milestone M-30-03 description was approved at the August Unit Managers Meeting.

2. Soil Gas Survey

Sites:

Main Fuel Oil Unloading Station  
Diesel Oil Unloading Station  
Outlet of Each 166-N Storage Tank  
Un-N-1 Burn Pit

Status:

Soil Gas Collection - Complete  
Field screening at burn pit and landfill - Complete  
Report - In preparation

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# 100-HR-3, 100-NR-2 OU's

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Task Name	1991				1992							
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
RECREIAL INVESTIGATION	[Solid black bar]											
Task 3 Geologic Investigation	[Solid black bar]											
3.1 Data Compilation	[Solid black bar]											
3.2 Geologic Mapping	[Solid black bar]											
Task 5-Judose Investigation	[Solid black bar]											
5.1 Data Compilation	[Solid black bar]											
Task 6-Groundwater Investig.	[Solid black bar]											
6.1 Data Compilation	[Solid black bar]											
6.2 Field Activities	[Solid black bar]											
6.2.1 Fitness for Use Survey	[Solid black bar]											
6.2.2 Well Installation	[Solid black bar]											
Well D-8	[Solid black bar]											
Well D-9	[Solid black bar]											
Well D-10	[Solid black bar]											
Well D-11	[Solid black bar]											
Well D-12	[Solid black bar]											
Well D-13	[Solid black bar]											
Well D-14	[Solid black bar]											
Well D-15	[Solid black bar]											
Well D-16	[Solid black bar]											
Well D-17	[Solid black bar]											
Well D-18	[Solid black bar]											
Well D-19	[Solid black bar]											
Well H-1	[Solid black bar]											
Well H-2	[Solid black bar]											
Well H-3	[Solid black bar]											
Well H-4	[Solid black bar]											
Well H-5	[Solid black bar]											
Well H-6	[Solid black bar]											
Well H-7	[Solid black bar]											
Well 6000-3	[Solid black bar]											
Well 6000-2	[Solid black bar]											
Well 6000-1	[Solid black bar]											
000.3 Water Level Measurement	[Solid black bar]											
6.2.4 Bk Monitoring	[Solid black bar]											
6.2.5 Groundwater/Soil Sampl.	[Solid black bar]											
6.3 Laboratory Analysis	[Solid black bar]											
6.4 Data Validation	[Solid black bar]											
6.5 Data Evaluation	[Solid black bar]											
6.6 Quarterly Monitoring	[Solid black bar]											
Task IS - RI REPORT	[Solid black bar]											
FEASIBILITY STUDY	[Solid black bar]											
IRRI PLAN	[Solid black bar]											
INTERIM R00	[Solid black bar]											

**100 HR-3 GROUNDWATER OPERABLE UNIT  
WORK SUMMARY 9/16/92**

TASK 3 - GEOLOGIC INVESTIGATION

*Data Compilation* - WHC released a report titled, "Geologic Information Summary for the Northern Portion of the Hanford Site". A Geologic Map was completed in June, 1992.

TASK 5 - VADOSE INVESTIGATION

*Data Complilation* - WHC released a report titled, "Hydrologic and Geologic Data Available for the Region North of Gable Mountain".

TASK 6 - GROUNDWATER INVESTIGATION

*Data Complilation* - WHC released a report titled, "Hydrologic Information Summary for the Region North of Gable Mountain" in September, 1992.

*Quarterly Monitoring* - Two rounds of groundwater samples have been taken.

*Data Validation* - Approximately 5% of the soil and first round groundwater data has been validated. Approximately 80% of the data has returned from the laboratories and is in process of being validated.

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100 NR-2  
GROUNDWATER WELL DRILLING  
STATUS 9/16/92

Well #	Start Date	Present Depth (ft)	Finish Date	Status
N-80	7/10/92	TD 126 ft.	8/6/92	Completed

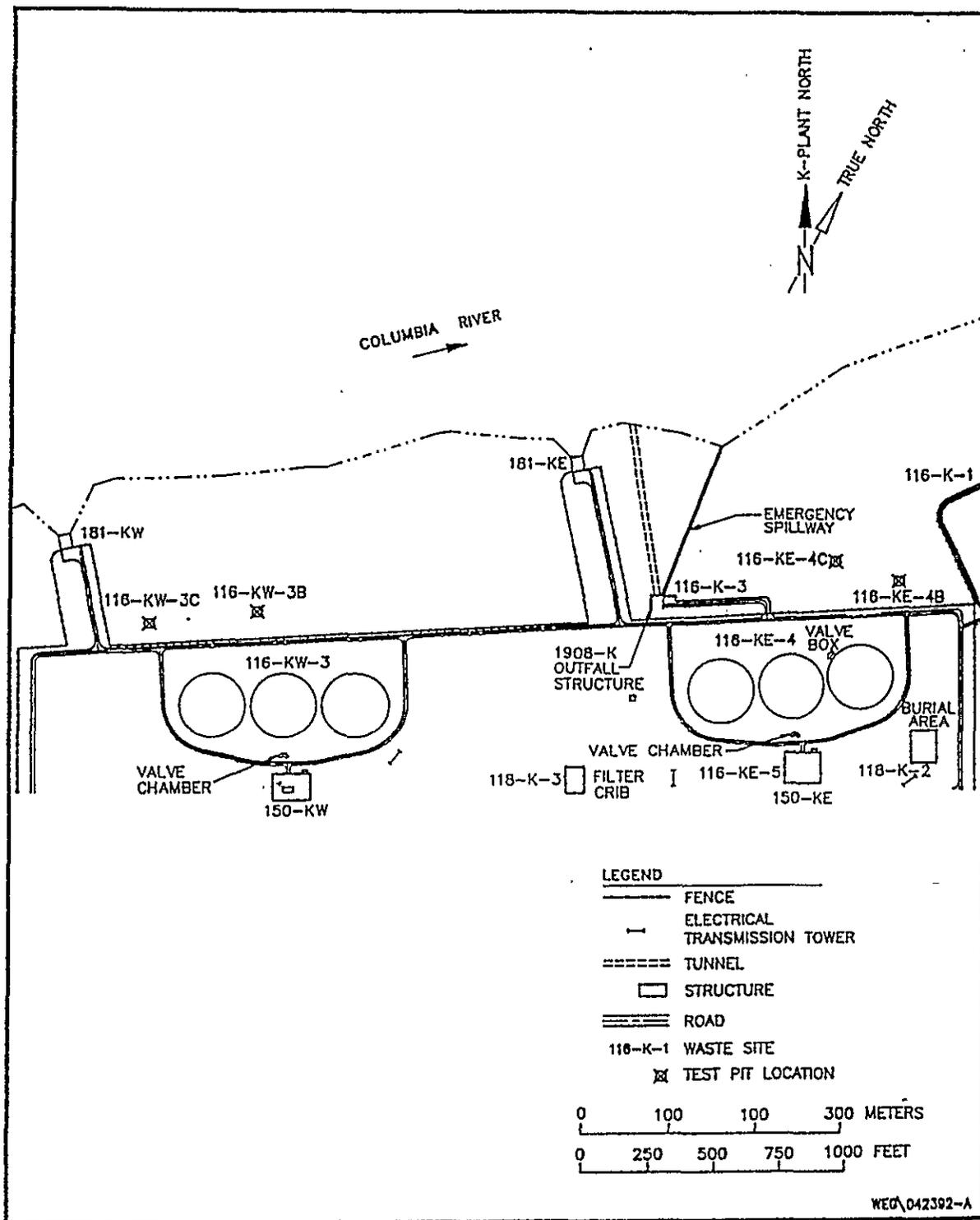
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**100-BC-1, 100-KR-1, 100-FR-1 OU's**

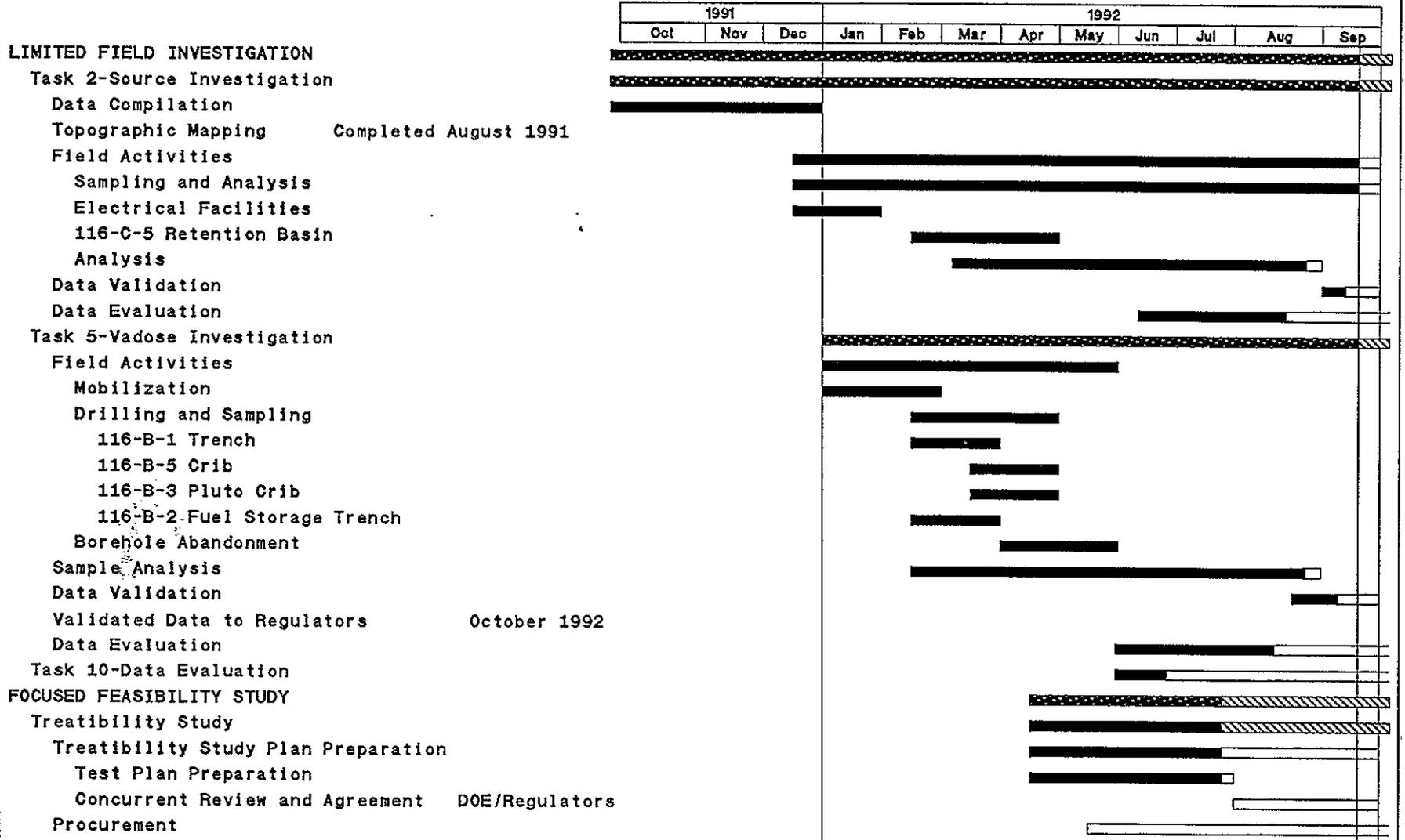
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Figure 1. Location of Test Pits 116-KW-3B, 116-KW-3C, 116-KE-4B, and 116-KE-4C.

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### 100-BC-1 OPERABLE UNIT



Summary

Progress

Data Date  
18Sep92

**100-FR-1 1993 VADOSE DRILLING**

<b>BOREHOLE</b>	<b>NO. HOLES</b>	<b>NO. TEST PITS</b>
116-F-1 Lewis Canal	1	2
116-F-2 Basin Overflow Trench	1	
116-F-3 Fuel Storage Basin Trench	1	
116-F-6 Liquid Waste Disposal Trench	1	
116-F-9 PNL Animal Waste Leach Trench	3	
116-F-14 Retention Basins	1	
108-F French Drain	1	

DRILLING SCHEDULED FOR MARCH 1993

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**100-BC-5, 100-KR-4, 100-FR-3 OU's**

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**100-BC-5 DRILLING STATUS**

WELL NUMBER	START DATE	COMPLETION DATE	CURRENT DEPTH	INST. READINGS	SCREEN INSTALLED
199-B3-46	2/19/92	2/28/92	TD 67'	N/A	3/30/92
199-B3-47	2/19/92	2/25/92	TD 61'	N/A	5/4/92
199-B2-12	2/19/92	4/1/92	TD 179'	H <sup>+</sup> , 144'	5/20/92
199-B2-13	2/26/92	3/3/92	TD 40'	N/A	3/25/92
199-B4-8	2/20/92	3/5/92	TD 90'	N/A	4/1/92
199-B4-9	4/6/92	4/21/92	TD 90'	400cpm 16-23'	5/28/92
199-B9-2	3/4/92	3/12/92	TD 118'	N/A	4/29/92
199-B9-3	3/3/92	3/18/92	TD 109'	N/A	4/8/92
199-B8-6	3/10/92	3/23/92	TD 89'	H <sup>+</sup> , 50'	4/3/92
199-B5-2	3/25/92	4/10/92	TD 76'	N/A	4/30/92

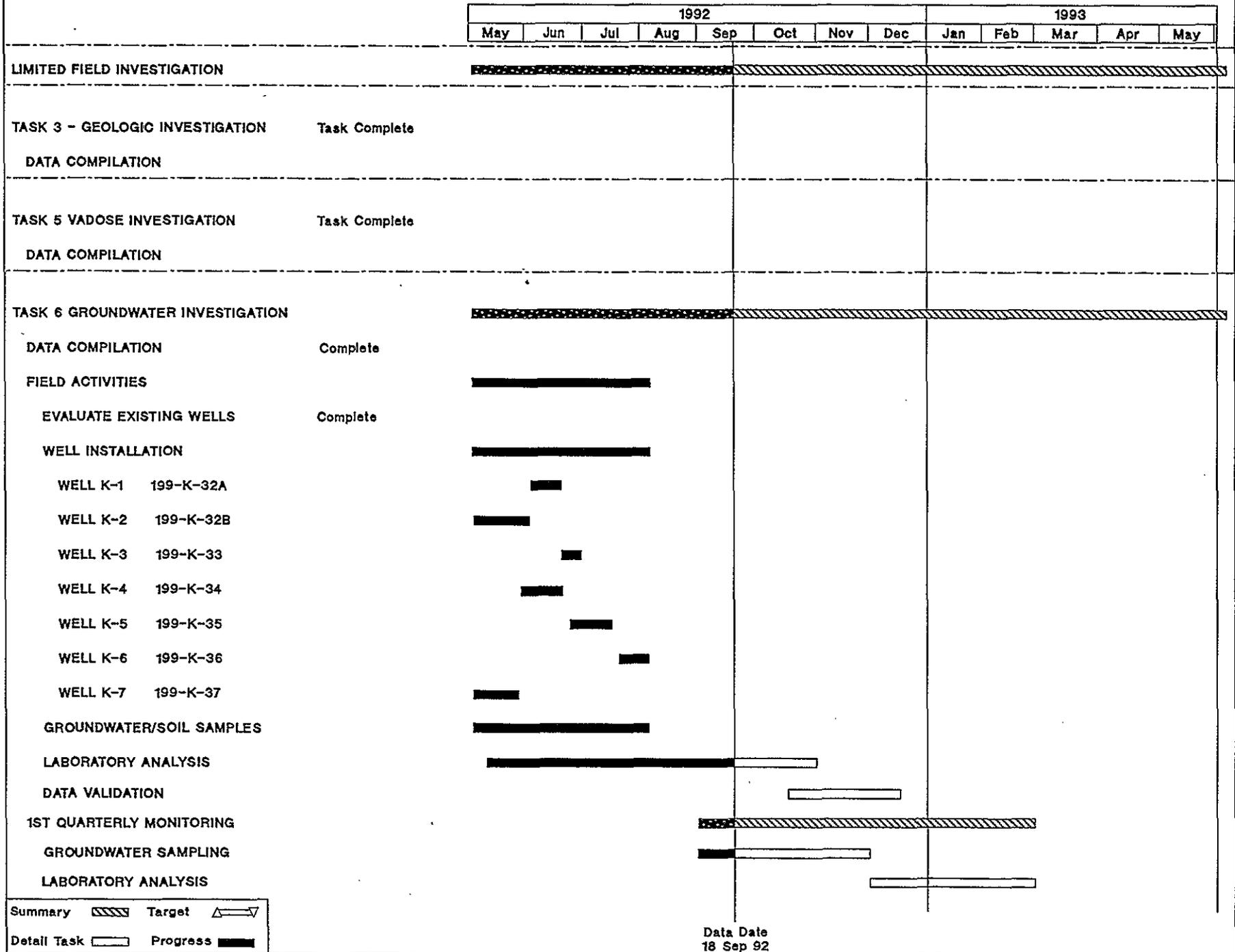
- ALL FY92 DRILLING ACTIVITIES COMPLETE (APRIL)

- 1ST QUARTER GROUNDWATER SAMPLING COMPLETE (JULY)

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# 100-KR-4 OPERABLE UNIT



Summary [Hatched] Target [White with arrow]  
 Detail Task [White with black outline] Progress [Solid black]

Data Date  
18 Sep 92

**100-KR-4 DRILLING STATUS**

WELL NUMBER	START DATE	COMPLETION DATE	CURRENT DEPTH	INST. READINGS	SCREEN INSTALLED
199-K-37	5/4/92	5/26/92	TD 70 ft	N/A	6/23/92
199-K-32A	6/8/92	6/16/92	TD 70 ft	N/A	7/21/92
199-K-32B	5/4/92	6/5/92	TD 175 ft	H <sup>+</sup>	7/30/92
199-K-33	6/19/92	6/29/92	TD 66 ft	N/A	7/15/92
199-K-34	5/29/92	6/17/92	TD 89 ft	N/A	8/3/92
199-K-35	6/23/92	7/15/92	TD 116 ft	H <sup>+</sup>	8/6/92
199-K-36	7/20/92	8/13/92	TD 109 ft	H <sup>+</sup>	8/11/92

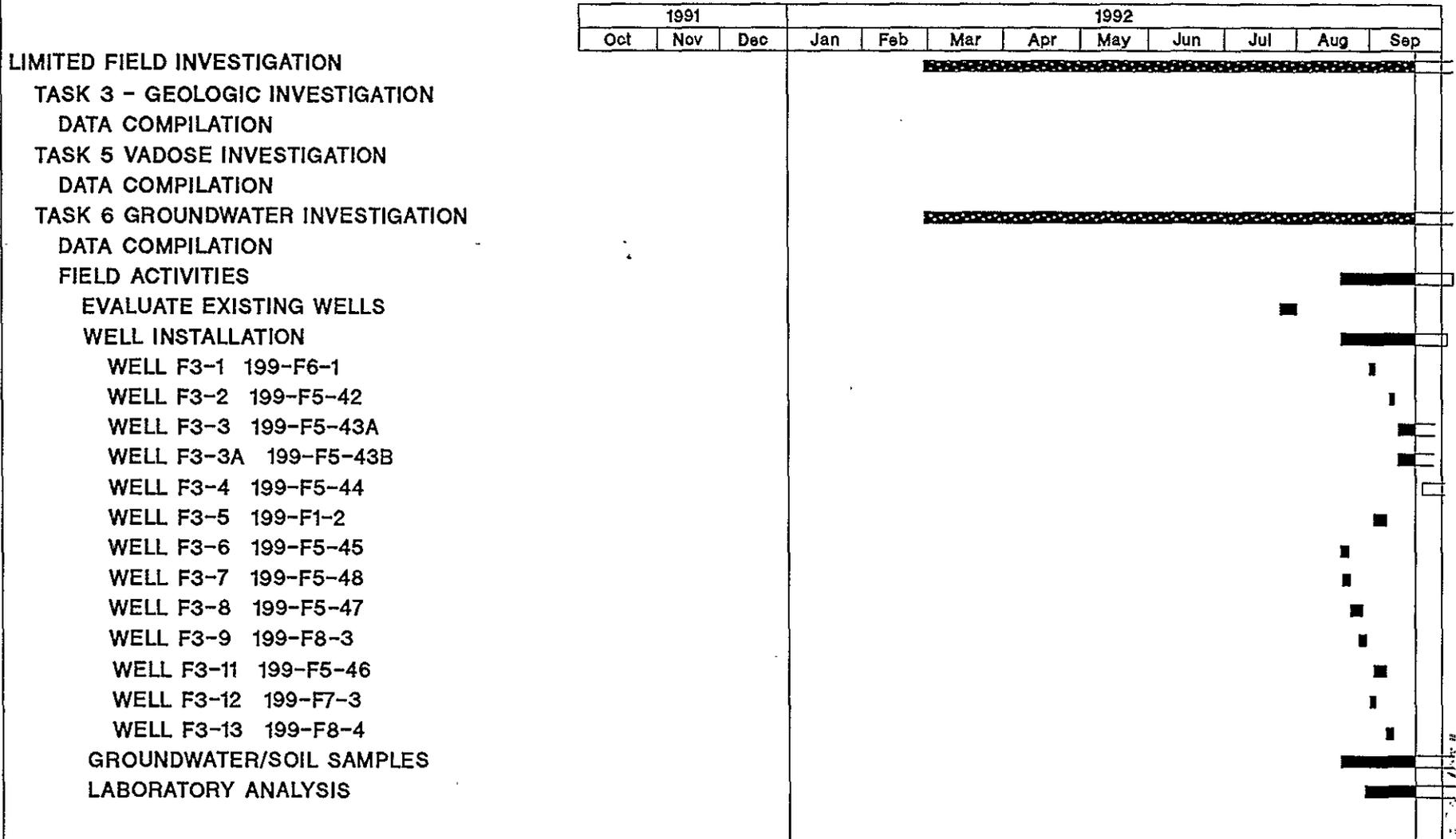
- ALL FY92 DRILLING ACTIVITIES COMPLETE (AUGUST)

- 1ST QUARTER GROUNDWATER SAMPLING SCHEDULED FOR SEPTEMBER

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# 100-FR-3 OPERABLE UNIT



Data Date  
18 Sep 92

**100-FR-3 DRILLING STATUS**

WELL NUMBER	START DATE	COMPLETION DATE	CURRENT DEPTH	INST. READING	SCREEN INSTALLED
199-F1-2	9/3/92	9/9/92	TD 37.5 ft	N/A	9/18/92
199-F5-42	9/14/92	9/16/92	TD 35 ft	N/A	
199-F5-43A	9/23/92				
199-F5-43B	9/21/92		18 ft	N/A	
199-F5-44					
199-F5-45	8/18/92	8/20/92	TD 52.6 ft	N/A	9/9/92
199-F5-46	9/4/92	9/9/92	TD 57 ft	N/A	9/22/92
199-F5-47	8/21/92	8/27/92	TD 63 ft	N/A	9/15/92
199-F5-48	8/19/92	8/21/92	TD 55 ft	N/A	9/11/92
199-F6-1	9/1/92	9/2/92	TD 53 ft	N/A	
199-F7-3	9/1/92	9/2/92	TD 33 ft	N/A	9/17/92
199-F8-3	8/25/92	8/27/92	TD 34 ft	N/A	9/15/92
199-F8-4	9/11/92	9/15/92	TD 47.5 ft	N/A	

- FY92 DRILLING ACTIVITIES INITIATED (AUGUST)

- 1ST QUARTER GROUNDWATER SAMPLING SCHEDULED FOR DECEMBER

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**100 AREA FEASIBILITY STUDY  
SOIL REMEDIATION ALTERNATIVES  
AND TREATABILITY STUDIES**

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**September 23, 1992**

**KEY ISSUE: WHY ARE 100 AREA SOIL REMEDIATION ALTERNATIVES SO LIMITED?**

**SECONDARY ISSUE: ARE THERE MORE SOIL TREATABILITY STUDIES THAT NEED TO BE DONE THAT HAVEN'T BEEN IDENTIFIED?**

**100 AREA FS METHODOLOGY:**

- SCREENING STARTS WITH THE UNIVERSE OF APPLICABLE TECHNOLOGIES AND PROCESS OPTIONS - BOTH CONVENTIONAL AND INNOVATIVE ARE INCLUDED.
- INITIAL SCREENING CULLS OUT THOSE THAT ARE NOT IMPLEMENTABLE, I.E., WON'T WORK FOR HANFORD CONTAMINANTS OR SITE CONDITIONS.
- SECOND SCREENING CULLS OUT THOSE THAT ARE NOT EFFECTIVE, OF LIMITED EFFECTIVENESS, OR TOO DIFFICULT TO PRACTICALLY IMPLEMENT. COST IS A SECONDARY CONSIDERATION.
- SECOND SCREENING ALSO ELIMINATES THOSE THAT ARE NOT SUFFICIENTLY DEVELOPED TO ESTABLISH A REASONABLE PERFORMANCE CONFIDENCE LEVEL.
- ALTERNATIVES DEVELOPED USING THE REMAINING TECHNOLOGIES TO SPAN THE RANGE OF GENERAL RESPONSE ACTIONS BUT KEEP THE NUMBER OF ALTERNATIVES REASONABLE.

**TREATABILITY STUDY SELECTION METHODOLOGY:**

- TREATABILITY STUDIES ARE SELECTED TO PROVIDE PERFORMANCE DATA FOR HANFORD SPECIFIC CONTAMINANTS AND CONDITIONS FOR THOSE TECHNOLOGIES WHICH NEED SUCH DATA.
- R&D EFFORTS TO DEVELOP TECHNOLOGIES ARE NOT INCLUDED AS TREATABILITY STUDIES.

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**TECHNOLOGY INFORMATION SOURCES:**

- REMEDIAL ACTION ASSESSMENT SYSTEM (RAAS), A PNL DATABASE
- EPA SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION (SITE) PROGRAM
- FSs FOR OTHER DOE SITES, E.G. FERNALD
- SYMPOSIUM PAPERS
- PERSONAL INTERVIEWS WITH PNL RESEARCHERS
- WHC ENGINEERING STUDIES
- VENDOR LITERATURE
- STANDARD TEXTS

**AVAILABILITY OF TECHNOLOGIES:**

- MANY TECHNOLOGIES AVAILABLE FOR GROUNDWATER; GROUNDWATER IS THE FOCUS OF MOST OF THE R&D
- FEW TECHNOLOGIES AVAILABLE FOR SOIL REMEDIATION; OF THESE MOST ONLY WORK ON ORGANIC CONTAMINANTS

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**BASIS AND KEY ASSUMPTIONS:**

- EXISTING DATA USED FOR THE FS
  - NO STRONG EVIDENCE OF ORGANIC CONTAMINATION IN 100 AREA
  - CONTAMINATION PRIMARILY CHROMIUM, NITRATES, RADIONUCLIDES INCLUDING TRITIUM
  
- FS DISCUSSES ORGANICS REMEDIATION AS A CONTINGENCY; ALTERNATIVES WILL NEED TO BE REVISITED IF SPECIFIC SOURCES ARE DISCOVERED
  
- ALL THE TECHNOLOGY AND ALTERNATIVE SCREENING RESULTS CAN BE REVISITED WITH NEW INFORMATION; THIS WILL OCCUR IN THE FOCUSED FSs, IF NEEDED

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**SCREENING PARAMETERS:**

- IS THE TECHNOLOGY CONVENTIONAL OR INNOVATIVE?
  - CONVENTIONAL MEANS THAT IT IS WELL-DEVELOPED AND HAS BEEN USED IN SIMILAR SITE REMEDIATION APPLICATIONS, EVEN THOUGH IT MAY NOT HAVE BEEN USED FOR HANFORD-LIKE CONTAMINANTS AND CONDITIONS.
  - INNOVATIVE MEANS THAT IT MAY OR MAY NOT BE WELL-DEVELOPED AND HAS NOT BEEN USED IN SITE REMEDIATION APPLICATIONS OF THE TYPE INTENDED FOR HANFORD.
  - WELL-DEVELOPED MEANS THAT IT HAS BEEN TESTED ON AT LEAST A PILOT SCALE BUT PREFERABLY HAS BEEN FIELD DEMONSTRATED IN AT LEAST ONE SITE APPLICATION.
- WHAT CONTAMINANTS DOES THE TECHNOLOGY HANDLE?
  - MANY TECHNOLOGIES ARE LIMITED TO ORGANICS REMEDIATION; SOME OF THESE ARE LIMITED TO VOCs ONLY; SOME ONLY WORK ON NON-CHLORINATED ORGANICS
  - THERE ARE FEWER TECHNOLOGIES WHICH HANDLE INORGANICS (INCLUDING METALS) AND RADIONUCLIDES.
- IS THE TECHNOLOGY IMPLEMENTABLE?
  - CONSIDERS DIFFICULTY IN CONSTRUCTION, INSTALLATION, OR IMPLEMENTATION; OPERATIONAL RELIABILITY; AND MAINTENANCE NEEDS
- IS THE TECHNOLOGY EFFECTIVE?
  - CONSIDERS LONG-TERM PROTECTIVENESS AND REDUCTION IN MOBILITY, VOLUME, OR TOXICITY FOR THE SPECIFIC CONTAMINANTS OF CONCERN; SHORT-TERM RISK DURING REMEDIATION IS A SOMEWHAT SECONDARY CONSIDERATION
- IS THE TECHNOLOGY COST-EFFECTIVE?
  - BECOMES A BALANCING CRITERIA ONLY IF COSTS ARE GROSSLY EXCESSIVE FOR THE BENEFIT ACHIEVED.

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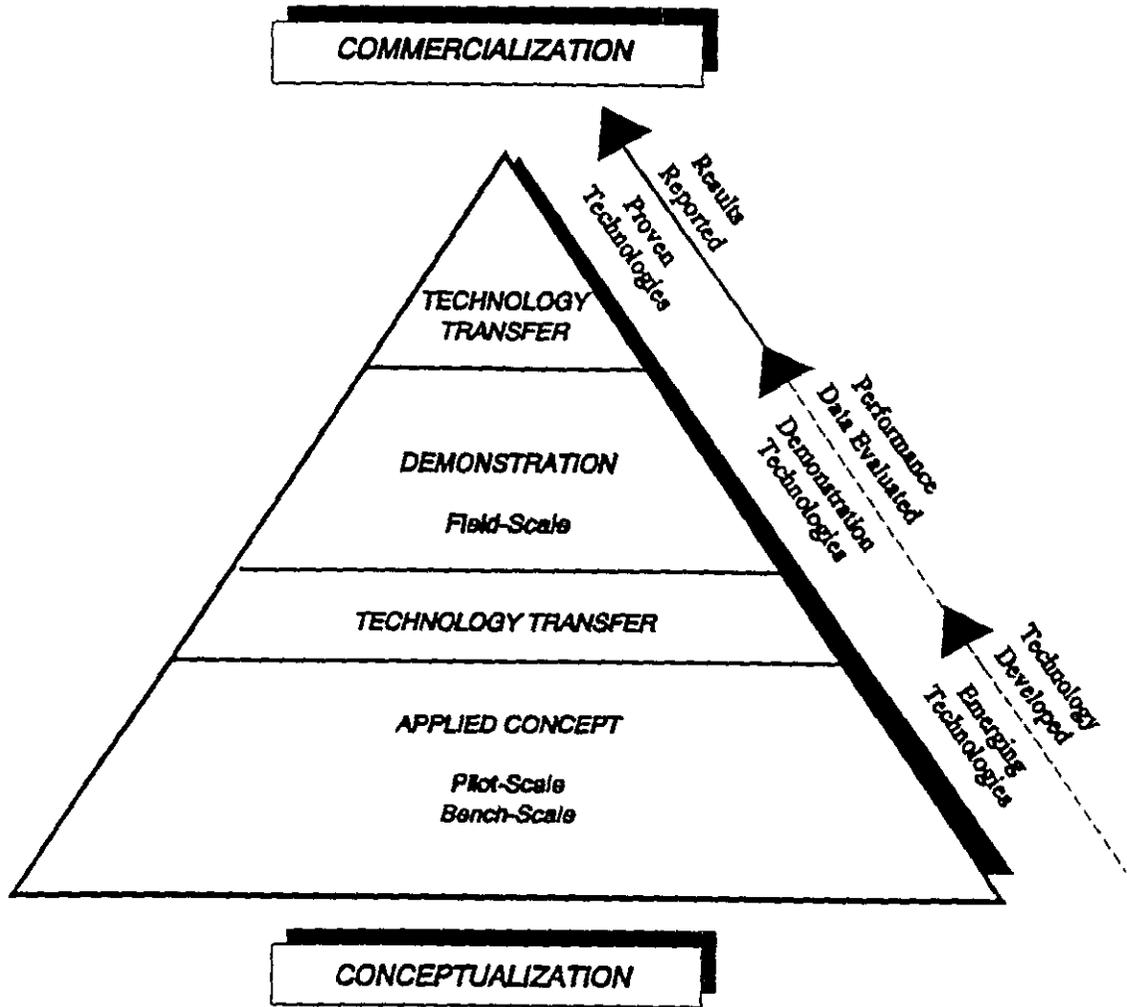


Figure 1. Development of Alternative and Innovative Technologies

TABLE 1 - COMPLETE LIST OF TECHNOLOGIES AND PROCESS OPTIONS CONSIDERED FOR SOILS					
GRA	TECHNOLOGY	PROCESS OPTION	CONVENTIONAL /INNOVATIVE	ORGANICS	INORG./ RADS
Institutional Actions	Access Restrictions	Fencing	C	X	X
		Deed Restrictions	C	X	X
	Monitoring	Leachate Monitoring	C	X	X
Containment	Capping	Asphalt-based Covers	C	X	X
		Concrete-based Covers	C	X	X
		Soil/Clay Covers	C	X	X
		RCRA Caps	C	X	X
		Hanford Barrier	I	X	X
		Synthetic Cover	C	X	X
		Vitrification	I	X	X
	Horizontal Barrier	Grout Injection	I	X	X
		Cryogenic Wall	I	X	X
		Vitrification	I	X	X
	Vertical Barrier	Slurry Wall	C	X	X

**TABLE 1 - COMPLETE LIST OF TECHNOLOGIES AND PROCESS OPTIONS CONSIDERED FOR SOILS**

GRA	TECHNOLOGY	PROCESS OPTION	CONVENTIONAL /INNOVATIVE	ORGANICS	INORG./ RADS
		Grout Curtain	C	X	X
		Sheet Piling	C	X	X
Containment	Vertical Barrier	Cryogenic Wall	I	X	X
		Biological Barrier	I	X	X
	Run-on/Run-off Control	Diversion/ Collection	C	X	X
		Grading	C	X	X
		Revegetation	C	X	X
Removal/ Disposal	Removal	Excavation	C	X	X
	On-Site Disposal	Trenches/Pits	C	X	X
		Vaults	C	X	X
		Tumulus	C	X	X
		RCRA Landfills	C	X	INORG. ONLY
	Off-Site Disposal	RCRA Landfills	C	X	INORG. ONLY

TABLE 1 - COMPLETE LIST OF TECHNOLOGIES AND PROCESS OPTIONS CONSIDERED FOR SOILS					
GRA	TECHNOLOGY	PROCESS OPTION	CONVENTIONAL /INNOVATIVE	ORGANICS	INORG./ RADS
		DOE Disposal Facilities	C	X	X
		Geologic Repositories	NOT AVAIL.		
Removal/ Treatment/ Disposal	Thermal Treatment	Thermal Desorption	C	X	
		Incineration	C	X	
		Pyrolysis	C	X	
		Molten Solids Processing	I	X	X
	Stabilization/ Solidification	Bitumen-based	C	X	X
		Cement-based	C	X	X
		Polymer-based	C	X	X
		Vitrification	I	X	X
	Physical Treatment	Vapor Extraction	C	VOCs ONLY	
		Physical Soil Washing	C I FOR HANFORD	X	X

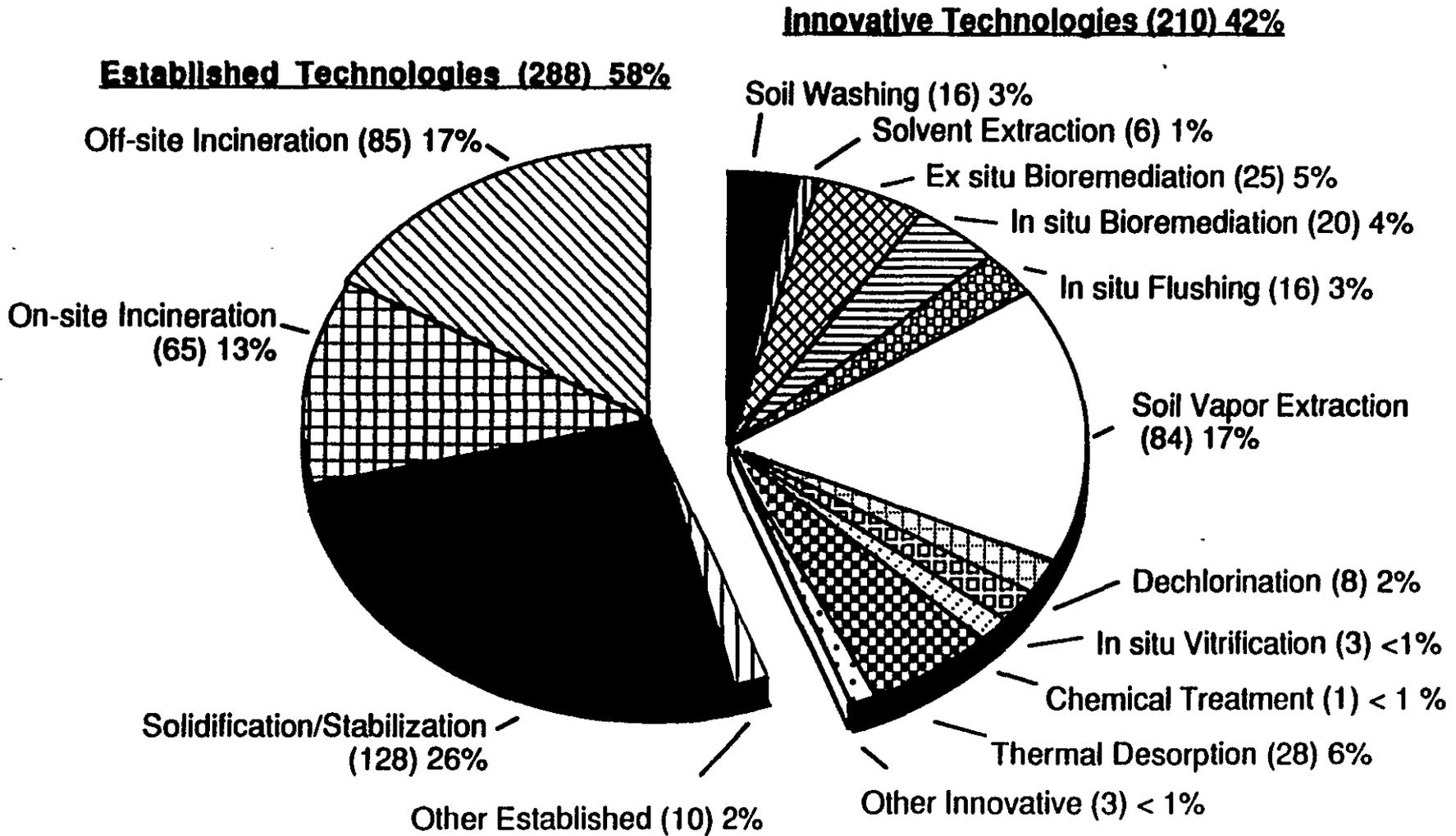
TABLE 1 - COMPLETE LIST OF TECHNOLOGIES AND PROCESS OPTIONS CONSIDERED FOR SOILS

GRA	TECHNOLOGY	PROCESS OPTION	CONVENTIONAL /INNOVATIVE	ORGANICS	INORG./ RADS
		Steam Stripping	I FOR SOILS	X	
	Chemical Treatment	Chemical Oxidation	I FOR SOILS	X	
		Soil Washing	I FOR HANFORD	X	X
		Alkali Metal Dechlorination	I	CHLOR. ONLY	
	Biological Treatment	Bioreactors	I FOR SOILS	X	
		Land Treatment	I	X	
		Biodenitrification	C	NITRATE ONLY	
In Situ Treatment	Stabilization/Solidification	Grout Injection	C	X	X
		Vibration-aided Grout Injection	I	X	X
		Shallow Soil Mixing	C	X	X
		Fixants	C	X	X
		Vitrification	I	X	X
		Ground Freezing	I	X	X

TABLE 1 - COMPLETE LIST OF TECHNOLOGIES AND PROCESS OPTIONS CONSIDERED FOR SOILS

GRA	TECHNOLOGY	PROCESS OPTION	CONVENTIONAL /INNOVATIVE	ORGANICS	INORG./ RADS
		Dynamic Compaction	C	X	X
	Biological	Enhanced Soil Bioremediation	I	X	
		Biodenitrification	C	NITRATE ONLY	
		Land Farming	I	X	
	Chemical	Soil Flushing	I	X	X
	Physical	Vapor Extraction	C	VOCs ONLY	
		Steam Stripping	I IN SITU	X	
		Soil Flushing	I	X	
		RF Heating	I	X	
		Electrical Soil Heating	I	X	

# Remedial Actions: Summary of Alternative Treatment Technologies Through Fiscal Year 1991



April 30, 1992

TABLE 2 - LISTING OF SOILS TECHNOLOGIES AND OPTIONS SCREENED OUT

GRA	TECHNOLOGY	PROCESS OPTION	SCREENING STEP*	RATIONALE
Containment	Capping	Vitrification	1	Not developed for seamless cap
		Asphalt Covers Concrete Covers Soil/Clay Covers Synthetic Covers	2	Inadequate long-term performance for isolating radionuclides
	Horizontal Barriers	Cryogenic Walls	1	Insufficient moisture;added water mobilizes contaminants
		Vitrification	1	Not developed for seamless cap
		Grout Injection	2	Grout placement control difficult; long-term performance uncertain
	Vertical Barriers	Sheet Pilings	1	Can't install in rocky soils
		Cryogenic Walls	1	Insufficient moisture;added water mobilizes contaminants
		Biological Barriers	1	Stable barrier not feasible; added reagents mobilize contaminants
		Grout Curtain	2	Difficult to form continuous curtain in rocky soils
In Situ Treatment	Stabilization/ Solidification	Grout Injection	2	Grout placement control difficult; long-term performance uncertain

\* 1 = 1ST SCREENING FOR IMPLEMENTABILITY

2 = 2ND SCREENING FOR EFFECTIVENESS

TABLE 2 - LISTING OF SOILS TECHNOLOGIES AND OPTIONS SCREENED OUT				
GRA	TECHNOLOGY	PROCESS OPTION	SCREENING STEP*	RATIONALE
		Shallow Soil Mixing	2	Not effective for deep contamination
		Fixants	2	Not effective for long-term contaminant control; limited to surface contamination
		Ground Freezing	2	Insufficient moisture; added water mobilizes contaminants
	Biological	Land Farming	1	Contamination too deep
		Enhanced Soil Bioremediation	2	Effectiveness uncertain due to depth of contamination; mobilization of contaminants
	Chemical	Soil Flushing	2	Effective flushing requires intimate reagent contacting; mobilized contaminants requires complete capture
	Physical	Soil Flushing	2	Same as chemical flushing; limited to water soluble contaminants
		RF Heating	2	Limited to organics; limited to shallow contamination; not demonstrated
		Electrical Soil Heating	2	Limited to organics; not demonstrated
Removal/Treatment /Disposal	Thermal Treatment	Incineration	2	High operating cost relative to thermal desorption; permitting difficult

\* 1 = 1ST SCREENING FOR IMPLEMENTABILITY

2 = 2ND SCREENING FOR EFFECTIVENESS

TABLE 2 - LISTING OF SOILS TECHNOLOGIES AND OPTIONS SCREENED OUT

GRA	TECHNOLOGY	PROCESS OPTION	SCREENING STEP*	RATIONALE
		Pyrolysis	2	Similar to incineration; high operating cost relative to thermal desorption
		Molten Solids Processing	2	Not demonstrated; very high capital/O&M costs
	Stabilization/ Solidification	Bitumen Based Cement Based Polymer Based	2	Bulk soil application: large increase in waste volume; best application is to soil washing fines
	Chemical Treatment	Chemical Oxidation	2	Limited to organics; requires expensive chemical extraction which potentially adds to contamination
		Alkali Metal Dechlorination	2	Limited to chlorinated organics; reagents are degraded by water
	Biological	Land Treatment	2	Limited to non-chlorinated organics

\* 1 = 1ST SCREENING FOR IMPLEMENTABILITY

2 = 2ND SCREENING FOR EFFECTIVENESS

TABLE 3 - RETAINED TECHNOLOGIES AND OPTIONS FOR SOILS					
GRA	TECHNOLOGY	PROCESS OPTION	ALTERN. NO.	TREAT. STUDY?	COMMENTS
Institutional Actions	Access Restrictions	Fencing	SS-2	No	
		Deed Restrictions	SS-2	No	
Containment	Capping	RCRA Caps	SS-3,4,10	No	
		Hanford Barrier	SS-3,4,10	No	
	Vertical Barrier	Slurry Wall	Not used	No	Treatability study for groundwater application
	Run-on/Run-off Control	Diversion/ Collection Grading Revegetation	SS-3	No	
Removal/ Disposal	Removal	Excavation	SS-4	Yes*	* Demonstrate field instrumentation and dust control through IRM Program
	On-Site Disposal	Trenches/Pits Vaults	SS-4	Yes**	** Determine soil moisture content through IRM Program
		RCRA Landfills	Not Used	No	

TABLE 3 - RETAINED TECHNOLOGIES AND OPTIONS FOR SOILS

GRA	TECHNOLOGY	PROCESS OPTION	ALTERN. NO.	TREAT. STUDY?	COMMENTS
	Off-Site Disposal	RCRA Landfills	SS-5 (Deleted)	No	
		DOE Disposal Facilities	SS-5 (Deleted)	No	
Removal/ Treatment/ Disposal	Thermal Treatment	Thermal Desorption	SS-10	Yes	Treat. studies on waste residues; treat bulk soil, if LDR
	Stabilization/ Solidification	Ex Situ Vitrification	SS-10	Yes	Treat. studies on waste residues; treat bulk soil, if LDR
		Additive-based Solidification (cement, grout, polymers)	Not Used (Screened Out)	Yes	Treat. studies on waste residues; treat bulk soil, if LDR
	Physical Treatment	Vapor Extraction	Not Used	No	Revisit if data show VOCs present
		Physical Soil Washing	SS-10	Yes	
		Steam Stripping	Not Used	No	Revisit if data show organics present
	Chemical Treatment	Soil Washing	SS-11 (Deleted)	Yes	

TABLE 3 - RETAINED TECHNOLOGIES AND OPTIONS FOR SOILS

GRA	TECHNOLOGY	PROCESS OPTION	ALTERN. NO.	TREAT. STUDY?	COMMENTS
Removal/ Treatment/ Disposal	Biological Treatment	Bioreactors	Not Used	No	Treatability study for groundwater application
		Biodenitrification	Not Used	No	Treatability study for groundwater application
In Situ Treatment	Stabilization/ Solidification	Vibration-aided Grout Injection	Not Used	No	Treatability study for solid waste application
		In Situ Vitrification	SS-9	No	Treatability study for compacted solid waste
		Dynamic Compaction	Not Used	No	Treatability study for solid waste
	Biological	Biodenitrification	SS-9	No	Treatability study for groundwater
In Situ Treatment	Physical	Vapor Extraction	SS-9	No	Revisit if data show organics present
		Steam Stripping	SS-7 (Deleted)	No	Revisit if data show organics present

**Gaynor Dawson (V.P. of ICF Technology Inc.) Performed an Independent Review of the 100 Area FS. Phase 1 and 2 Report.**

- **In agreement with the FS conclusions.**

**"Soil washing may also be particularly applicable to Hanford because of the variety of contaminant combinations that may be encountered."**

- **Two Suggested modifications:**
  - **Retain soil flushing (in-situ soil washing) alternative.**
  - **Recognize that some sites will be unique and applicable alternatives may need to be revisited (e.g. petroleum only waste sites).**

Attachment #15

Laboratory Status: Turnaround Times

The information provided by OSM at the Sept UMM for the 100 Areas is as follows:

For the time period starting May 1, 1992 and ending Sept. 15, 1992, 705 samples from the 100 Areas had been sent to the commercial laboratories.

Of the 705 samples sent, 205 of these samples had data due that could equal or exceed 100 days.

Of the 205 samples that had data due, 203 were complete with 3 samples now over 100 days and pending completion.

14 samples of the 203 reported as complete were received in excess 100 days with the average Turnaround Time for these 14 samples of 106 days.

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Distribution  
 Unit Manager's Meeting: 100 Aggregate Area/100 Area Operable Units  
 September 23, 1992

Julie K. Erickson . . . . . Chief, Env. Remed. Br., DOE-RL, ERD (A5-19)  
 Mike Thompson . . . . . DOE-RL, EAP/RPB (A5-19)  
 Diane Clark . . . . . DOE-RL, TSD/SSB (A5-55)  
 Steve Balone . . . . . DOE-HQ (EM-442)  
 Suzanne Clarke, SWEC . . . . . GSSC to DOE-RL (A4-35)

Dennis Faulk . . . . . 100 Aggregate Area Manager, EPA (B5-01)  
 Ward Staubitz, USGS . . . . . Support to EPA  
 Audree DeAngeles, PRC . . . . . Support to EPA

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 Bob Henckel, WHC . . . . . (H4-55)  
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 Roberta Day, WHC . . . . . (H4-55)  
 Powers, Linda L., WHC . . . . . DOE-HQ  
 Diana Sickle WHC (L4-92)  
 Chris Abraham . . . . . GAO (A1-80)

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ADMINISTRATIVE RECORD: 100 AAMS; Care of EDMC, WHC (H4-22)

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Please inform Suzanne Clarke (SWEC) of deletions or additions to the distribution list.